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13. ABSTRACT (Maximum 200 Words) The current study examines the effects of a psychological intervention that encourages emotional expression in prostate cancer patients and their partners. Prostate cancer patients (n=130) and their partners are randomly assigned to an intervention or a control group. Following Pennebaker's model, subjects in the intervention group are asked to write about their deepest thoughts and feelings regarding their cancer experience for 20 minutes each day for these consecutive days. The control group is asked to write about trivial non-emotional topics. Outcome variables including psychological distress, quality of life, and physical symptoms is assessed at baseline and over a period of nine months after the intervention (one week, three, six, and nine months). In accordance with our approved Statement of Work data collection is currently underway. To date 142 subjects have been enrolled and are at various stages of the data collection process. Data processing is continuing as planned, including data entry and verification, which has been completed for all subjects currently enrolled in the project. Preliminary data analyses are being conducted.		
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Introduction

The current study examines the effects of a psychological intervention that encourages emotional expression in prostate cancer patients and their partners. Prostate cancer patients (n=130) and their partners are recruited at Chicago area hospitals. Eligibility of patients includes ability to read and write in English, absence of evidence of metastatic disease, absence of any concurrent chronic condition or concurrent or prior history of psychiatric disorders, and having a spouse or partner. Patients are recruited between two months to five years after diagnosis, and after completion of active cancer treatment (e.g., surgery, radiation). They are also asked for permission to contact their spouse or partner for recruitment into the study. As it is our goal to recruit a partner for each patient to maximize effectiveness of the intervention, the only exclusion criteria for patients' partners will be inability to read and write in English or any psychiatric disorder that would preclude participation. Patients and their partners are randomly assigned to an intervention or a control group. Subjects in the intervention group are asked to write about their deepest thoughts and feelings regarding their cancer experience for 20 minutes each day for three consecutive days. The control group is asked to write about trivial non-emotional topics. *Intervention Group:* Subjects are told to write continuously for 20 minutes about their deepest thoughts and feelings about their cancer experience (spouses/partners will write about how they have been affected by the patient's illness), and about how it relates to other aspects of their lives, e.g., their family life, relationship with their spouse, sexuality, daily activities, work, social life, etc. The instructions are designed such that subjects will feel free to write about the aspects of their experience that are important to them. To encourage emotional expression, it is emphasized that their writing samples will be kept completely confidential and anonymous and will only be identified by the participant's number, not their name. The essays will later be processed by independent blind readers who have no knowledge of the participant's identity or group assignment. Finally, participants are told to not worry about style, grammar, or spelling and that no feedback will be provided to them regarding the contents of the essays. *Control Group:* Procedures follow standard protocols used in previous research. Subjects are asked to write for 20 minutes each day about a trivial non-emotional topic that is assigned to them (e.g., description of their routine daily activities). Subjects will be told to remain factual and not add any emotional content. All other procedures will be identical to the Intervention Group.

Outcome variables including psychological distress, quality of life, and physical symptoms are assessed at baseline and over a period of nine months after the intervention (one week, three, six, and nine months).

Specific Aim I: To examine the effectiveness of the emotional writing intervention for patients and their partners. **Specific Aim II:** To examine mechanisms for the effects of expressive writing. **Specific Aim III:** To begin to identify those individuals who will be most likely to benefit from this type of intervention.

Body

Task 1: Preparation for the study (month 1 to 2):

The research protocols have been developed including instructions for all aspects of the protocol and questionnaire packets for each assessment. Research assistants have been trained to administer all parts of the protocol including the intervention, all assessments, and debriefings.

Task 2: Data collection (month 1 to 34 + 1 year extension):

Collaborating physicians are referring research subjects on an ongoing basis. Currently a total of 142 subjects (94 patients, 48 spouses) have been recruited into the protocol and are at various stages of the data collection process. We have been granted a one-year no-cost extension to continue recruiting subjects. Therefore, we are continuing to receive referrals from our collaborators and are screening and recruiting subjects on a regular basis. Interviews and interventions are being conducted by the research assistants and follow-up assessments are done at one week, 3, 5, and 9 months post-intervention as planned. We are keeping track of recruitment and subject follow-up using a computerized database (ongoing). Weekly research meetings are in place to deal with the day to day running of the project.

Task 3: Data processing (month 6 to 34 + 1 year extension):

All data currently collected have been entered. Data verification is conducted periodically to ensure accuracy of data processing.

Task 4: Data analyses (month 34-36 + 1 year extension):

Preliminary data analyses have been conducted and results are being written up for conference presentations and publications.

Key Research Accomplishments

- A total of 142 participants are enrolled in the study.
- Additional referrals are being obtained on an ongoing basis and patients are being screened for eligibility.
- Data entry and verification is conducted on an ongoing basis.
- Weekly research meetings are conducted.
- Preliminary data analyses are being conducted for conference presentations and publications.

Reportable Outcomes

The following results are based on analyses with parts of the study sample and/or a combination of the patient sample recruited for this study and gynecological cancer patients recruited as part of another study.

Results reported in annual report of February 2003:

1. Emotional expression is an important means of coping with stressful experiences such as cancer. Social barriers to expression may have adverse effects. Research has suggested that men are less likely to express their emotions and have different patterns of social support compared to women. We examined whether male cancer patients have a lower tendency to express emotions, are less likely to perceive social barriers to expression, and are differentially affected by social barriers from different support sources as compared to women. Questionnaires were administered to 41 gynecological cancer patients and 41 prostate cancer patients using baseline data from the intervention project. There was a trend towards greater emotional expressivity in women as compared to men but no significant gender differences in perceptions of social constraints from spouse/partner or others. Multiple regression analyses revealed that men experienced significantly greater distress in association with social constraints from their spouse/partner than did women. Men may be more vulnerable to social barriers to expression than previously assumed. Gender differences in emotional expressivity may be less important than the social context in which expression takes place.

Zakowski, S.G., Schwab, C., Krueger, N., & Laubmeier, K., Garrett, S., Flanigan, R., Johnson, P. (in press). Social barriers to emotional expression and their relations to distress in male and female cancer patients. British Journal of Health Psychology.

2. Individuals facing the stress of cancer often rely on their social networks to allow them to express their thoughts and emotions in an effort to cope with their illness. However, these efforts are sometimes met with negative responses that inhibit their emotional expression (i.e., social constraints) which in turn may lead to increased distress. We hypothesized that expressive writing would buffer the distress associated with such social barriers. Patients diagnosed with cancer ($N=103$) within the past five years were randomly assigned to an experimental group, who wrote about their deepest thoughts and emotions about their cancer experience for 20 minutes a day for three consecutive days, or a control group who wrote about non-emotional topics. Patients (49% male) were ages 25-84, 95% Caucasian, 81% married, and had been diagnosed with prostate or gynecological cancer. They completed the Brief Symptom Inventory (BSI, distress) at baseline and 3 months post-intervention (Time 2), and the Social Constraints Scale (SCS) at baseline. Multiple regression analysis regressing Time 2 distress on baseline distress, SCS, Group, and SCS x Group revealed a significant SCS x Group interaction ($p=.015$) indicating that expressive writing buffered the distress associated with social constraints. These findings suggest that cancer patients whose social network responds negatively to their efforts to express their emotions regarding their cancer may be most likely to benefit from a writing intervention. Patients who encounter few such social barriers may have less of a need for additional emotional outlets. This underscores the importance of matching psychological interventions to patients' needs. These findings were presented at the American Psychological Society, Barcelona, Spain, March, 2002. Manuscript in press in *Health Psychology*.

3. Repressive coping marked by a dispositional tendency to suppress disclosure of negative emotions may have adverse effects including increased physiological responses to stressors and progression of disease in cancer patients. We examined whether repressors are less likely to benefit from an expressive writing intervention compared to non-repressors (classified according to Marlowe-Crowne Social Desirability Scale (MCSDS)/Taylor Manifest Anxiety Scale (TMAS)).

Patients diagnosed with prostate or gynecological cancer (N=109) within the past five years were randomly assigned to an experimental group, who wrote about their deepest thoughts and emotions about cancer for 20 minutes a day for three days, or a control group who wrote about non-emotional topics. Patients (51% female) were between the ages of 25-84, 95% Caucasian, 81% married. They completed the Brief Symptom Inventory (BSI, distress) at baseline and 3 months post-intervention (Time 2), the TMAS, and the MCSDS. Multiple regression controlling for baseline distress revealed main effects for social desirability and trait anxiety predicting Time 2 distress ($p's < .01$). A TMAS x MCSDS x Group interaction ($p < .04$) revealed that repressive copers (high desirability/low anxiety) benefited the least from the intervention, whereas truly low anxious patients and patients high on anxiety and social desirability benefited the most. Repressed copers may prefer other means of coping with stress and thus not benefit from interventions that focus on emotional expression. Individual differences should be considered when implementing interventions. Presented at the Society of Behavioral Medicine conference, Washington, D.C., April 2002.

4. Another individual difference variable of interest is neuroticism. We examined whether individuals high on trait neuroticism, characterized by chronic display of negative affect, benefit from interventions that focus on emotional expression of negative events or whether these exacerbate their negative affect. We examined depressive symptoms (BSI, POMS) and intrusive thoughts about cancer (IES) in 106 male and female cancer patients before (Baseline) and six months (Follow-up) following the emotional expression intervention. Patients (age: $M = 60$, 53% female, 78% married, time since diagnosis: $M = 1.5$ years) were randomly assigned to an expression and a control condition. Multiple regression regressing Depression at 6-month Follow-up on Baseline Depression, Neuroticism (NEO-FFI), Group, and Neuroticism x Group revealed a significant interaction ($p's < .01$). Participants low on Neuroticism who were in the expression condition experienced decreased depression at follow-up compared to controls. However, those high on trait Neuroticism reported increased depression after the intervention. Interestingly, they also exhibited increased intrusive thoughts as indicated by a Neuroticism x Group interaction ($p = .035$). It has been theorized that emotional expression may exert its benefits by enhancing cognitive processing of stressful experiences resulting in longterm reductions in intrusive thoughts and concomitant decreases in negative affect. According to our data this was the case for individuals low on Neuroticism, however expression had the opposite effect on high neurotic individuals who responded with increased intrusive thoughts and depression. It is thus essential to take personality differences into account when administering emotional expression interventions to individuals dealing with major life stressors. These findings were presented at the International Society of Behavioral Medicine, Helsinki, Finland, August, 2002.

5. Written emotional disclosure of traumas has been associated with improvements in an individual's psychological adjustment, such as reduced levels of intrusive thoughts. It has been hypothesized that a certain level of emotional awareness (LEA) is necessary in order to effectively engage in emotional disclosure and thus obtain these benefits.

Emotional awareness (EA) is defined as the capacity to be consciously aware of emotion and to constructively use emotional information. Lane and Schwartz (1987) proposed that EA undergoes 5 levels of structural transformation along a cognitive-developmental pathway with higher levels reflecting an increasing degree of organization in emotional experience. Using a novel application of the LEA model (Lane, 1990) to score patients' essays on LEA, we examined whether patients exhibiting a higher level of emotional awareness in their writing reported fewer intrusive cancer-related thoughts post-writing, reflecting greater benefits of disclosure. Prostate cancer patients ($N = 17$) wrote for 20 minutes for 3 consecutive days about their emotions regarding their cancer experience. Intrusive thoughts were assessed at baseline and 6 months post-writing. Essays were scored and rated on LEA. Regression analyses controlling for baseline intrusive thoughts showed that high LEA was associated with lower intrusive thoughts ($r = -0.537$, $p = 0.043$) at follow-up. The findings suggest that a greater ability to recognize and express emotions (higher LEA) facilitates resolution of a stressful experience via written emotional disclosure, as evidenced by a reduction in intrusive thoughts. This preliminary investigation demonstrates the usefulness of a new application of the LEA model in the analysis of the emotional content of personal essays and suggests that patients with high EA are more likely to benefit from emotional disclosure. These findings will be presented at the Society of Behavioral Medicine, Salt Lake City, Utah, March 2003.

New findings since February, 2003

1. Life-threatening events challenge one's schema about personal vulnerability.

Emotional expression is associated with adjustment to such events possibly by assimilating the information of vulnerability with existing cognitive schemas.

Assimilation may occur by changing the meaning of the threat and reducing the individual's sense of vulnerability. We examined whether emotional disclosure about patients' cancer experience would result in reductions in perceptions of vulnerability (e.g., risk of recurrence).

Gynecological ($n=69$) and prostate cancer ($n=69$) patients who had completed active cancer treatment, diagnosed within the past 5 years were randomly assigned to write about their emotions regarding their cancer experience or about their daily activities (controls). They completed a Perceived Risk Scale (PRS) and Impact of Events Scale at baseline, 3 and 6 months post-writing.

Groups were comparable on demographic and medical characteristics. The PRS, developed for this study, consists of 2 subscales, perceived risk for poor cancer prognosis and worry about risk. Repeated measures ANCOVA revealed a significant time main effect ($p < .05$) and a significant condition by time interaction ($p = .02$). Perceptions of risk increased over time but this was moderated by condition. Patients who wrote about their cancer showed less of an increase in risk perceptions than controls. Risk perceptions were significantly correlated with worry and intrusive thoughts about cancer (r 's = .38 to .48) suggesting that perceptions of risk play a significant role in psychological adjustment

to cancer. Neither worry nor intrusive thoughts changed as a function of writing condition.

Emotional disclosure buffered the increase in perceived risk that patients were experiencing over time. Patients' vulnerability may increase as they are no longer under constant medical supervision. Emotional disclosure may be an effective intervention to prevent this increase. These findings were presented at the international conference of (Non)expression of emotions and health in Tilburg, NL, October, 2003.

2. Differential effects of emotional disclosure in male and female cancer patients:
Emotional disclosure has been shown to be beneficial in individuals dealing with a variety of traumatic and stressful experiences. While little is known about gender differences in the effects of disclosure, it has generally been found that women are more likely to use emotional expression as a form of coping with stress than are men. It is therefore often assumed that men may be less likely to benefit from emotional disclosure. The present study investigated the effects of written emotional disclosure in male and female cancer patients.

Using Pennebaker's writing paradigm, 80 gynecological cancer patients and 84 prostate cancer patients were randomly assigned to two conditions. In the disclosure condition participants wrote about their emotions regarding their cancer experience for 20 minutes a day for three consecutive days. Controls wrote about their daily activities. Moods (POMS) were assessed at baseline, three, and six months post-writing.

A 2 (gender) by 2 (condition) repeated measures ANOVA revealed a significant gender by condition interaction ($p < .01$). Inspection of means showed that while women exhibited little change in response to the disclosure intervention, men reported reduced mood disturbance at six months post-intervention.

Women may have other emotional outlets possibly in their social environment that mask the effects of writing. The results suggest the value of implementing interventions that provide male cancer patients with a means to express their emotions.

Abstract submitted for presentation at the International Psycho-oncology Society, Copenhagen, Denmark, August, 2004

3. Evidence for the moderating effect of time of intervention on the benefit of emotional expression:

Past research has provided evidence that written emotional expression after experiencing a traumatic event results in decreased distress and improved mental health. However, some research involving Critical Incidence Stress Debriefing (CISD) has suggested that if the emotional disclosure occurs immediately following the stressful event the effects to the individual are either not helpful or detrimental. To date, little research has examined the specific point in time, following trauma, at which written emotional expression is most beneficial. This study hypothesized that benefits of expressive writing depend on time of intervention relative to the onset of the stressful event (i.e., diagnosis of cancer). Participants included 39 Prostate and 38 Gynecologic cancer patients who were recruited post-treatment within five years of their cancer diagnosis. The mean age of participants was 58.9 years and 94.8% of participants were Caucasian. Participants were contacted to participate by both phone and mail. After completing a baseline mood questionnaire (Profile of Mood Scale, POMS), participants were asked to write about their cancer

experience for twenty minutes a day for three consecutive days in the privacy of their own homes. The POMS was again administered 3 and 6 months following the writing intervention. Days since diagnosis at time of intervention ranged from 61-1,837. Early (61-285 days), middle (286-544 days) and late (over 544 days) intervention groups were formed via tertile splits on days from diagnosis to commencement of the emotional writing intervention. No between-group baseline POMS differences were found ($p=.60$). A 3 (Time of Intervention: early, middle, late) x 3 (Assessment: baseline, 3-months, 6-months) mixed-model ANOVA revealed a significant Time of Intervention x Assessment effect ($p<.05$). Simple effects analyses revealed decreases in total mood disturbance (as measured by POMS) from baseline to 3-months ($p=.06$), 3- to 6-months ($p=.07$) and baseline to 6-months ($p=.04$) for the early intervention group. Significant effects were, however, not evident for middle or late intervention groups for any epoch. These results suggest that time of intervention does affect the level of benefit gained from emotional expression through writing. Specifically, there is evidence that an emotional writing task administered between 60 and 285 days after cancer diagnosis may be more beneficial than when administered after this time span. This finding offers new information regarding intervention for those working with trauma victims or clients who have experienced significant stressful events. It seems that treatments involving emotional disclosure which are implemented sometime between 2-10 months following the event may be helpful for these populations. However, additional research needs to examine the effects of writing tasks which take place immediately after a stressful event has occurred (i.e., from 0-60 days).

Findings will be presented at the American Psychological Society, in Chicago, IL, May, 2004.

Conclusions

The research protocol is running as planned and no modifications are necessary at this point. While data collection is still ongoing we several interesting findings to date: In comparison to female cancer patients, prostate cancer patients report greater distress in association with social constraints; expressive writing buffers the negative effects of social constraints: repressive copers and neurotics benefit less from expressive writing; the use of higher levels of emotional awareness in expressive writing is associated with greater reduction in intrusive thoughts about cancer. In addition, we have found that expressive writing is associated with reduced perceptions of the threat posed by cancer; the effects of expressive writing on distress depend on the time of the intervention relative to the cancer diagnosis; and men show greater reductions in distress than do women. We will continue to conduct analyses to address the other study aims as more data are collected.

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